

Serial No. 10/811,133

STATUS OF THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in this application. No claims have been amended by this preliminary amendment.

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Listing of Claims:

1. (Original) Aqueous dispersion useful for internal sizing or surface sizing in the production of paper, comprising at least one cellulose reactive sizing agent selected from the group consisting of ketene dimers and multimers, at least one cellulose non-reactive sizing agent, and at least one emulsifier selected from the group consisting of oxyalkylene phosphate and sulfate esters and salts thereof.

2. (Original) Dispersion as claimed in claim 1 further comprising at least one cationic organic compound having a weight average molecular weight less than about 10000.

3. (Original) Dispersion as claimed in claim 1 further comprising at least one anionic stabilizer.

4. (Original) Dispersion as claimed in claim 1, comprising at least one emulsifier selected from the group consisting of oxyalkylene phosphate esters and salts thereof.

5. (Original) Dispersion as claimed in claim 1, wherein the oxyalkylene phosphate and sulfate esters are of the formula:



where R^4 is $-OH$ or $-O - A^2 - R^5$;

A^1 and A^2 , independently of each others, are oxyalkylene chains;

Q is $PO(OH)$ or SO_2 ; and,

R^3 and R^5 , independently of each others, are hydrocarbon groups.

6. (Original) Dispersion as claimed in claim 5, wherein Q is $PO(OH)$.

7. (Original) Dispersion as claimed in claim 1, wherein the cellulose non-reactive sizing agent is selected from the group consisting of copolymers of styrene or substituted styrene with at least one other kind of ethylenically unsaturated monomers.

8. (Original) Dispersion as claimed in claim 7, wherein said at least one other kind of ethylenically unsaturated monomers are selected from the group consisting of alkyl esters of acrylic acid or methacrylic acid.

9. (Original) Dispersion as claimed in claim 2, wherein the cationic organic compound is a surfactant selected from the group consisting compounds having the general formula $R_4N^+ X^-$, where each R group, independently of each other, is hydrogen or a hydrocarbon groups having from 1 to 30 carbon atoms, and X is an anion.

10. (Original) Dispersion as claimed in claim 3, wherein the anionic stabilizer is selected from the group consisting of condensed naphthalene and lignin sulfonates.

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11. (Original) Dispersion as claimed in claim 1, wherein the dispersion is predominantly anionic.

12. (Original) Dispersion as claimed in claim 1, wherein the pH is from about 2 to about 6.

13. (Original) Aqueous dispersion useful for internal sizing or surface sizing in the production of paper, comprising at least one cellulose reactive sizing agent selected from the group consisting of ketene dimers and multimers, at least one cellulose non-reactive sizing agent selected from the group consisting of copolymers of styrene or substituted styrene with at least one other kind of ethylenically unsaturated monomers, at least one emulsifier selected from the group consisting of oxyalkylene phosphate esters and salts thereof, at least one cationic organic compound having a weight average molecular weight less than about 10000 and at least one anionic stabilizer.

14. (Original) Dispersion as claimed in claim 13, wherein the oxyalkylene phosphate esters are of the formula:



where R^4 is $-OH$ or $-O-A^2-R^5$;

A^1 and A^2 , independently of each others, are oxyalkylene chains with from 2 to 100 oxyalkylene units;

Q is $PO(OH)$; and,

R^3 and R^5 , independently of each others, are hydrocarbon groups having from 3 to 50 carbon atoms.

15. (Original) Dispersion as claimed in claim 14, wherein the cationic organic compound is a surfactant selected from the group consisting compounds having the general formula $R_4N^+ X^-$, where each R group, independently of each other, is hydrogen or a hydrocarbon groups having from 1 to 30 carbon atoms, and X is an anion.

16. (Original) Dispersion as claimed in claim 15, wherein the anionic stabilizer is selected from the group consisting of condensated naphthalene and lignin sulfonates.

17. (Original) A process for the preparation of a dispersion useful for internal sizing or surface sizing in the production of paper, comprising the steps of bringing together at least one cellulose reactive sizing agent selected from the group consisting of ketene dimers and multimers, at least one cellulose non-reactive sizing agent, and at least one emulsifier selected from the group consisting of oxyalkylene phosphate and sulfate esters and salts thereof, in the presence of water to obtain a mixture, and homogenizing the mixture to obtain an aqueous dispersion.

18. (Original) A process as claimed in claim 17 further comprising the steps of adding a cationic organic compound having a weight average molecular weight less than about 10000 and an anionic stabilizer before homogenizing the mixture.

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19. (Original) A process for the production of paper comprising the steps of forming a paper web from a stock containing cellulosic fibers and applying to the surface of the paper web an aqueous dispersion comprising at least one cellulose reactive sizing agent selected from the group consisting of ketene dimers and multimers, at least one cellulose non-reactive sizing agent, and at least one emulsifier selected from the group consisting of oxyalkylene phosphate and sulfate esters and salts thereof.

20. (Original) A process for the production of paper comprising the steps of adding to a stock containing cellulosic fibers a dispersion comprising at least one cellulose reactive sizing agent selected from the group consisting of ketene dimers and multimers, at least one cellulose non-reactive sizing agent, and at least one emulsifier selected from the group consisting of oxyalkylene phosphate and sulfate esters and salts thereof, and dewatering the stock on a wire to obtain paper and white water.